



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,257	06/29/2004	Ravikumar Ramachandran	FIS920040102US1	4256

32074 7590 03/29/2006

INTERNATIONAL BUSINESS MACHINES CORPORATION
DEPT. 18G
BLDG. 300-482
2070 ROUTE 52
HOPEWELL JUNCTION, NY 12533

EXAMINER

DUONG, KHANH B

ART UNIT	PAPER NUMBER
----------	--------------

2822

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/710,257	Applicant(s) RAMACHANDRAN ET AL.	
	Examiner Khanh B. Duong	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office Action is in response to the amendment filed January 3, 2006.

Accordingly, no claim was amended or canceled.

Claims 11-20 remain withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Currently, claims 1-10 remain active.

Election/Restrictions

Applicant's affirmation of the election with traverse of Invention I (claims 1-10) in the reply filed on January 3, 2006 is acknowledged. The traversal is on the ground(s) that both Invention I and Invention II recite the process limitation of "a dual-frequency PECVD process" to form a silicon nitride film. This is not found persuasive because Invention II is directed toward a semiconductor device, wherein process limitations are not given patentable weight because product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Jung et al.

(U.S. 2005/0170104 A1).

Re claim 1, Jung et al. ("Jung") discloses in FIG. 1B [see TABLES II & III; page 7, paragraph 0087 to page 8, paragraph 0095] a method of forming a PFET device comprising the steps: providing a substrate 102 having at least one gate stack 110; depositing a silicon nitride layer 118 by means of a dual-frequency plasma enhanced CVD process, the CVD process comprising a temperature in the range 375°C to 550°C (including 400°C to 550°C); forming a spacer on said at least one gate stack 110 from said silicon nitride layer 118; and forming a PFET device 100 comprising said at least one gate stack 110 having said spacer.

Re claim 2, Jung discloses in TABLE II said dual-frequency plasma enhanced CVD process further comprises a pressure in the range 2 Torr to about 15 Torr (including 2 Torr to 5 Torr).

Re claim 3, Jung discloses in TABLE II said dual-frequency plasma enhanced CVD process further comprises a low frequency power in the range 0 W to about 100 W (including 0 W to 50 W).

Re claim 4, Jung discloses in TABLE II said dual-frequency plasma enhanced CVD process further comprises a high frequency power in the range 10 W to about 200 W (including 90 W to 110 W).

Re claim 5, Jung discloses in TABLE II said dual-frequency plasma enhanced CVD process further comprises precursor gases of silane, ammonia and nitrogen at flow rates in the ratio in the range of 40-350:1,000-5,000:2,000-20,000 (including 240:3200:4000 sccm).

Re claim 6, Jung discloses in TABLE II said dual-frequency plasma enhanced CVD process further comprises a temperature of 375°C to 550°C (including 480°C).

Re claim 7, Jung discloses in TABLE II said dual-frequency plasma enhanced CVD process further comprises a pressure of 2 Torr to about 15 Torr (including 2.5 Torr).

Re claim 8, Jung discloses in TABLE II said dual-frequency plasma enhanced CVD process further comprises a high frequency power of about 10 W to 200 W (including 100 W) and a low frequency power of about 0 W to 100 W (including 40 W).

Re claims 9 and 10, see discussions above regarding claims 1-8.

Response to Arguments

Applicant's arguments filed January 3, 2006 have been fully considered but they are not persuasive.

Applicant persistently argues that Jung does not show forming a spacer from the silicon nitride film 118 deposited by the PECVD process. In response, the Examiner respectfully disagrees because, in Fig. 1B, Jung clearly shows the silicon nitride layer 118 formed on the gate stack 110. Any portion of the silicon nitride layer 118 on the gate stack 110 can be broadly

Art Unit: 2822

interpreted as a “spacer”. The limitation “forming a spacer ... from said silicon nitride layer” does not necessarily preclude such interpretation.

Applicant further argues “[s]ince the spacers 112, 114 already exist, there is no motivation in Jung for forming spacers from the silicon nitride layer 118”. In response, the Examiner respectfully agrees with respect to the subject matter as disclosed in the Jung reference. However, such argument is irrelevant in regard to the claimed subject matter.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

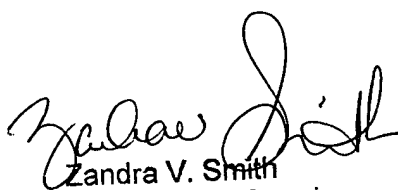
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KBD


Zandra V. Smith
Supervisory Patent Examiner
20 March 2006